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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,493	09/02/2003	Yun Soo Choe	1670.1015	2730

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STEIN, MCEWEN & BUI, LLP
1400 EYE STREET, NW
SUITE 300
WASHINGTON, DC 20005

EXAMINER	
PAIK, SANG YEOP	

ART UNIT	PAPER NUMBER
3742	

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/652,493	CHOE ET AL.	
	Examiner	Art Unit	
	Sang Y. Paik	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 7-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow (US 5,157,240) in view of Chandler (US 2,799,764) or Isaacson et al (US 3,842,241).

Chow shows a heating crucible having a main body container, a cover formed of an insulating material such as the nitride ceramic with a nozzle, a cover heater formed as a thin film on a top surface of the cover, a body heater for heating the main body, the cover heater having a single wire pattern with the positive and negative thermals, a thermocouple in the cover, a heat-resistant layer (25') on the cover heater, the main body also formed of an insulating material such as the nitride ceramic with a body heater as a thin film on the outer wall of the main body, a heat resistant layer (25) on the body heater, the body heater having a single wire pattern with the positive and negative terminals, the body heater is also formed on the bottom portion of the main body, and a thermocouple inside the main body. However, Chow does not show a heat reflective layer between the heater and the heat-resistant layer.

Chandler or Isaacson shows that it is well known in the art to provide a heating device having a heating element provided with a heat reflective layer to direct the heat toward the desired heating surface. In Chandler, it is shown that the heating element (72) is provided on a

heating surface (76) with a heat reflecting layer (62) disposed between the heating element and a heat resistant/insulating layer (78). Isaacson also shows a heating surface (14) upon which a heating element (50) provided thereto with a heat reflective layer (56) disposed between the heating element and a heat resistant layer (40).

In view of Chandler or Isaacson, it would have been obvious to one of ordinary skill in the art to adapt Chow with a reflective layer provided between the heat resistant layer and the heater to reflect the heat generated by the heater toward an intended heating direction.

With respect to claim 9, Chow shows the cover having a nozzle in the center of the cover with a cover heater provided around the nozzle. However, while, Chow does not show that the cove heater concentric pattern around the nozzle, it would have been obvious to one of ordinary skill in the art to provide the cover heater in the concentric pattern or any other pattern to affectively provide uniform and stable heating across the cover.

3. Claims 3, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view of Kano et al (US 6,242,719).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater being platinum.

Kano shows a heating element such as platinum or graphite deposited on an insulating ceramic layer such as pyrolytic boron nitride or aluminum nitride. In view of Kano, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of platinum as an alternative conductive material that can alternatively provide stable and uniform heating temperature, and with respect to claim 14, it

would have been obvious to further provide insulating material made of aluminum nitride that alternatively provide a good electrical and thermally conductive material.

4. Claims 8, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view Bichrt (US 6,162,300).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover or the main body is made of alumina or silicon carbide

Bichrt shows a ceramic body made of alumina or silicon carbide as well as pyrolytic boron nitride. In view of Bichrt, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover and the main body made of alumina or silicon carbide in place of the pyrolytic boron nitride since such is well known in the art to alternatively provide a mechanically and thermally stable body that can withstand a temperature, pressure and chemical stress.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view Okuda et al (US 4,804,823).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater is made of conductive paste with metal particles and metal oxides.

Okuda show that it is known in the art to provide a conductive paste made with metal particles or metal oxides applied to a ceramic substrate to form an electrical heater. In view of Okuda, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of conductive paste having the metal

particles and metal oxides to form a heating element that can provide a mechanically and thermally stable heater that can also withstand a high temperature.

6. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view Chen et al (US 6,024,799) or Murakami et al (US 5,728,223).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the nozzle having a convergent-divergent nozzle.

Chen and Murakami show that it is well known in the art to provide the gaseous outlet nozzle with a convergent-divergent nozzle that is flush with the gas outlet surface cover. In view of Chen or Murakami, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the nozzle having a convergent-divergent nozzle to provide a more defined outlet gas flow for even distribution of the vapor deposition.

Response to Arguments

7. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

With respect to Chow, the applicant argues that since the layer 25' of Chow is disclosed as a protective layer and not as a "heat-resistant layer" as recited in the claims, Chow does not meet the recited claims. The applicant further argues that since the applicant does not neither claim nor disclose that the "heat-resistant layer" is made of pyrolytic boron nitride and is 1.0 to few mils thick as shown in Chow, the recited "heat-resistant layer" is not the same as that the protective layer of Chow. The applicant's arguments are not deemed persuasive. According to the applicant's disclosure, a "heat-resistant layer" is a layer that is formed as a "thin film type"

(page 7, paragraph 35). Thus, the layer 25' of Chow, which is formed of a few mills, would meet such the applicant's definition of the "heat-resistant layer". It is also noted that Chow clearly shows the layer 25' (or 25) that is provided on the surface of the cover heater as well as on the surface of the body heater.

With respect to Chandler, the applicant argues the layer 78 which is disclosed as a paper, paperboard, cloth, or other suitable material is not the recited heat-resistant layer. This argument is not deemed persuasive since there is no reason why this layer cannot be served as a heat-resistant layer. A layer that impedes a heat transfer maybe considered as a heat-resistant layer, and the applicant has not disclosed that such material would be contrary to the applicant's definition of the heat-resistant layer. Likewise, with respect to Isaacson, the applicant argues the layer 40 which is disclosed as a holder constructed of plastic, is not the heat-resistant layer. But this argument is not deemed persuasive since there is no reason why this layer cannot be a heat-resistant layer as it provides the support and protection to the heater.

In both Chandler and Isaacson, a reflective layer is provided between a heater and a heat-resistant layer such heat is directed toward the direction of heater and away from the heat-resistant layer. Therefore, it would have been obvious to one of ordinary skill in the art to further adapt Chow with a reflective layer between the heater and the heat-resistant layer so that heat is directed toward the heater which is the desired heat direction.

With respect to claims 2 and 18, the applicant argues that the recited single wire pattern wherein the term "single" means "not accompanied by another or others" and as such the two heating elements pattern of Chow cannot be "a single wire pattern" as recited in the claims.

While Chow shows two wires, the claimed scope of " a single wire" is still met by Chow since single or one wire is included by two wires, each of the two wires being a single wire.

With respect to claims 7 and 25, the applicant argues that since the recited insulating materials do not recite that they are made of pyrolytic boron nitride as shown in Chow, claims 7 and 25 are not met by Chow. It is noted that the claim recite the insulating material has a good heat radiation property. The recited property can be met if the recited material is made of the same material as that of the claimed material. The claimed material in this case is an "insulating" material. There is no other claim recitation that distinguishes this material other than being an "insulating" material. Thus, Chow having an "insulating" material would meet such property. Again, there is no other claimed recitation that would distinguish the recited "insulating material" from that of the applied prior art Chow.

With respect to claim 9, the applicant argues that the examiner has not provided the motivation to modify the Chow's cover heater to be "formed in a concentric patter around the nozzle". This argument is not deemed persuasive. Chow discloses that it is important to provide a good uniform heat distribution to avoid hot and cold zones (see column 1, lines 60-68) and this would have been the motivation to provide the heating pattern in the concentric pattern. Chow shows a heating wire that encircles a hole or nozzle, and to one of ordinary skill in the art, it would have been obvious to modify the heating pattern in a concentric pattern or any other suitable pattern that would have provided a good uniform heating so that vaporization out of the nozzle is evenly heated. It is also noted that the applicant allows other forms of heating pattern other than a concentric pattern (paragraph 31).

With respect to claim 16, the applicant argues that the examiner did not discuss the feature of claim 16 in explaining the rejection. In the office action mailed on 11/17/05, in the response to argument section, it was explained that the claim 16 is a product by process claim wherein the patentability of an apparatus is defined by the product itself and not the process by which it is made. In claim 16, the cover heater is made by the process of spray coating a heat emitting material on the cover. On page 3, paragraph 3 of the office action, in the ground of rejection, it is stated that Chow shows "a cover heater is formed as thin film on a top surface of the cover...". This meets the recited the structure of the "heat emitting material on the cover" which form a heating block or a heater.

With respect to claim 20, the applicant argues that the body heater is formed over the sides of the main body and not over the bottom of the main body. Chow shows a main body having a bottom which is the bottom portion of the main body (10) wherein a body heater is formed over the bottom. As shown by Figure 2, the body heater formed along the side of the main body over or above the bottom of the main body. This clearly meets the claim recitation.

With respect to Okuda, the applicant argues there is no showing of the metal particles and metal oxides. Okuda teaches that the conductive paste is made with metal powders which meet the claimed metal particles (see Examples of Okuda).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. P.

Sang Y Paik
Primary Examiner
Art Unit 3742

syp